REMARKS

The claims were objected to. Claims 12 to 25 were rejected under 35 U.S.C. 112, first and second paragraphs. Claims 12, 13, 16 and 17 were rejected under 35 U.S.C. 102 (b) as anticipated by Massie.

Claims 1 to 27 have now been canceled without prejudice.

New claims 28 to 40 are presented to better clarify the present invention. Claim 28 is independent and claims 29 to 40 depend from claim 29, so that withdrawal of the objection to the claim numbering is respectfully requested. No new matter has been added.

It is respectfully submitted that claim 28 and the specification now provide a clear written description of the wave field microscope of the present invention, and that claim 28 is definite.

Claim 28 recites a wave field microscope in which on object is movable through a point pattern generated by two or three standing wave fields. Each object structure of the object causes a modulation of the light so that a point spread function of the wave field microscope is provided. The modulation is a function of the point spread function of the wave field microscope through convolution of the point pattern and the detection point spread function. (See specification at page 9, line 26 to page 10, line 21 for example). A space between two object structures thus is detectable as a function of values of the maximums, i.e. peaks, of the point spread function of the wave field microscope for the two object structures so as to permit the wave field microscope to measure geometric distances between the object structures.

Withdrawal of the rejections under 35 U.S.C. 112 first and second paragraphs is respectfully requested.

With respect the 35 U.S.C. 102 rejection under Massie et al., Massie et al. does not disclose "the interference pattern being a two- or three dimensional point pattern generated by two or three standing wave fields" or "the object being shiftable relative to the point pattern, each object structure causing a modulation of the light detected by the optical detection system within a detection point spread function, the modulation being given by the point spread function of the wave field microscope through convolution of the point pattern and the detection point spread function" as now recited in claim 28. Nor would it have been obvious to have so modified

Massie, as Massie first creates an interference pattern after the light hits an object to be measured, and the object is not shiftable.

Withdrawal of the rejection with respect to 35 U.S.C. 102(b) is respectfully requested.

Support for Claim Limitations

Specific support for the claim limitations is found in the original disclosure, for example as follows:

Claim 28: A wave field microscope comprising:

an illumination system for illuminating an object for examination ***(e.g. page16, line 4)*** with a plurality of coherent light beams through at least one objective lens arrangement ***(e.g. page 16, lines 5-10)*** , the object having a pluralty of object structures, the light beams interfering in at least one object plane and illuminating the object in the object plane with an interference pattern ***(e.g. page 16, lines 15-19 and page 25, lines 3-8)***,

an optical detection system ***(e.g. page 16, lines 20-27, and page 1, lines 8-9),*** and

a holding device for the object ***(e.g. page 1, lines 7-8)***,

the interference pattern being a two- or three dimensional point pattern generated by two or three standing wave fields ***(e.g. page 25, lines 3-8, and page 28, lines 15-17, and page 48, lines 16-21)***,

the object being shiftable relative to the point pattern ***(e.g. page 1, line 8, and page 19, lines 21-26, and page 20, lines3-6, and page 40, lines 16-17)***, each object structure causing a modulation of the light detected by the optical detection system within a detection point spread function, the modulation being given by the point spread function of the wave field microscope through convolution of the point pattern and the detection point spread function ***(e.g. page 7, line 21 - page 8 line 3, and page 10, lines 18-21, and page 38, line 7 - page 39, line 2)***,

for each object structure, a maximum of the point spread function of the wave field microscope being detectable within the detection point spread function using intensity measurements ***(e.g., page 7, lines 23-29, and page 35, lines 24-31)***,

a space between two object structures being detectable as a function of values of the maximums of the point spread function of the wave field microscope for the two object structures ***(e.g. page 35, lines 6-31, and page 13, lines 14-26)*** so as to permit the wave field

microscope to measure geometric distances between the object structures ***(e.g., page 19, line 15)***.

Claim 29: The wave field microscope as recited in claim 28 wherein the optical detection system detects fluorescent light. ***(e.g. page 20, line 30)***

Claim 30 (new): The wave field microscope as recited in claim 28 wherein the interfering light beams are adjustable to be aligned antiparallel or at a variable angle to one another. ***(e.g. page 18, line 1)***

Claim 31 (new): The wave field microscope as recited in claim 28 wherein the lens arrangement has at least two spatial directions, the lens arrangement having in at least one of the spatial directions a first objective lens with a first numerical aperture or a first reflector assigned to a second objective lens with a second numerical aperture higher than the first numerical aperture, and, in at least one of the other spatial directions, the lens arrangement has two other objective lenses with other numerical apertures lower than the second numerical aperture, or a third objective lens with a third numerical aperture lower than the second numerical aperture and a second reflector assigned to the third objective lens. ***(e.g., page 28, lines 1-17 and original claim 2)***

Claim 32 (new): The wave field microscope as recited in claim 28 wherein the illumination system includes at least one first illumination source for the light beams capable of coherence and at least one beam splitter for decoupling at least one of the light beams, the lens arrangement including a common lens assigned to both the first illumination source and the at least one beam splitter, the light beams and beam splitter capable of being coupled to said common lens so that on a rear focal plane facing away from an object space, the light beams produce two spaced apart focal points, and that in a further space between the rear focal plane and a further focal plane in the object space the light beams run in a variably-adjustable angle to one another and interfere to create a standing wave field. ***(e.g. page 17, line 19 to page 18, line 3 and original claim 3)***

Claim 33 (new): The wave field microscope as recited in claim 32 wherein the illumination system further comprises at least one additional coherent light beam, and the lens arrangement includes a further objective lens being assigned to additional coherent light beam, the further objective lens capable of directing and aligning the additional coherent light beam in the object space so that the additional coherent light beam interferes with the standing wave field produced by the light beams so as to generate the point pattern. ***(e.g. page 18, lines 21 to 31).***

Claim 34 (new): The wave field microscope as recited in claim 28 wherein the detection system comprises at least one detection objective lens similar to an objective lens of the objective lens arrangement. ***(e.g. page 18, lines 4 to 6)***

Claim 35 (new): The wave field microscope as recited in claim 28 wherein the holding device is arranged in the wave fields and is capable of being rotationally mounted about an axis. ***(e.g. page 1, lines 7-8 and page 25, lines 10 to 11)***

Claim 36 (new): The wave field microscope as recited in claim 35 wherein the holding device is capable of being rotated 360 degrees about the axis. ***(e.g. page 1, lines 7-8 and page 25, lines 10 to 11, and original claim 5)***

Claim 37 (new): The wave field microscope as recited in claim 28 wherein the point pattern is capable of being rotated about an axis. ***(e.g. page 24, lines 22- 30 and original claim 6)***

Claim 38 (new): The wave field microscope as recited in claim 28 wherein the holding device or and/or the point-pattern are capable of being rotated about an axis so as to illuminate the object sequentially or simultaneously with the point pattern. ***(e.g. page 24, lines 27- 28)***

Claim 39 (new): The wave field microscope as recited in claim 28 wherein the detection system includes a scanner reflector arranged so as to be suitable for forming an image of the object structures using the intensity measurements. ***(e.g. page 20, line 28)***

Claim 40 (new): The wave field microscope as recited in claim 28 wherein the illumination system includes in at least one first spatial direction a real illumination source for the two- or multi-photon excitation, and in at least one other spatial direction, another illumination source for the two- or multi-photon excitation, and the standing wave fields (WF_1 ,WF_2, …, WF_i) generated having wavelengths (λ_1, λ_2 …, λ_i) differing from one another, and having distances (d_1, d_2, …, d_i) between specific wave maxima or wave minima of $d_1 = \lambda_1/ 2n \cos\theta_1$ or $d_2 = \lambda_2/ 2n \cos\theta_2$ or $d_i = \lambda_i/ 2n \cos\theta_i$ where n equals the index of refraction in an object space and $\theta_1, \theta_2 ,\ldots \theta_i$ equals an intersection angle of the light waves of the wavelengths $\lambda_1, \lambda_2 \ldots,\lambda_i$ with an optical axis, and with the wave fields WF_1,WF_2 … W_i being aligned with respect to one another so that at least a maximum of at least two standing wave fields is situated at a same place. ***(e.g. original claim 8)***

CONCLUSION

It is respectfully submitted that the application is now in condition for allowance and applicants respectfully request such action.

Respectfully Submitted,

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